

# 2001 Comparative Analysis of Enterprise (Micro) Data Conference Program

## *Labour demand*

### **Disentangling the Minimum Wage Puzzle: An Analysis of Job Accessions and Separations from a Longitudinal Matched Employer-Employee Data Set**

Pedro Portugal (Bank of Portugal)

Ana Rute Cardoso (Univ of Minho)

Changes in the legislation in mid-80s in Portugal provide remarkable conditions for economic analysis, as the minimum wage increased very sharply for a very specific group of workers. Relying on a matched employer-employee panel dataset, we model gross job flows — accessions and separations — in continuing firms, as well as in new firms and those going out of business, using a Poisson regression model applied to proportions. Worker behavior is as well modeled. Employment trends for teenagers, the affected group, are contrasted against older workers, before and after the rise in the youth minimum wage.

The major effect on teenagers of a rising minimum wage is the reduction of separations from the employer, which compensates for the reduction of accessions (to new and continuing firms) and the rising dismissals from firms closing down. This result suggests the relevance of supply side factors overcoming demand forces, as they indicate that job attachment for low wage youngsters rises following an increase in their minimum wage. In this sense, our results can reconcile some of the previous evidence that has been presented in the empirical literature when analyzing the overall impact of the minimum wage on youth employment without looking at its sources.

**Keywords:** minimum wage, employment.

**JEL Classification:** D21, J38.

## **SKILL BIASED TECHNOLOGICAL CHANGE, LABOUR HOARDING, AND THE WAGE STRUCTURE: Estimates of Short-run and Long-run Changes in the Structure of Employment using linked employer-employee panel data for Germany**

**ARND KÖLLING (Institute for Employment Research)**

The adoption of modern technologies in the production process or the growth international trade are often blamed to change the structure of labour demand towards a decrease in the demand of low skilled and a rise in the demand of highly skilled employees during the last decades. Several empirical studies confirm these assumptions when panel data sets are used. Mainly, the data sets that are applied to this problem consist of a large amount of firms but exhibit only a few observations over time. Also, the data suffers from a high loss in information due to unit non-response of the firms. Therefore, the results of these studies should be questioned. The short times series may be indicate short-run changes like labour hoarding through a business cycle rather than long run alterations. On the other hand, official data with very long time series only contain a few information. In this study the balanced LIAB (1993 - 1998), a unique linked employer-employee panel data set combining information from the German Employment Statistics and the IAB-Establishment Panel is used to analyse the shortrun and long-run changes in labour demand. Information about more than 2,200 establishments are available over the whole period between 1993 and 1998. Employing a Generalised Leontief Cost Function demand for three different types of labour is estimated by a Seemingly Unrelated Regression Model. Additionally, the analysis allows for unobserved firm heterogeneity. The results show, that short-run effects like labour hoarding have a significant influence on the structure of labour demand, while capital-skill complementarities and influences of the firm's export behaviour vanishes when unobserved heterogeneities are introduced to the model. In opposite, the wage structure seems to be much more important to determine the actual skill structure in German establishments.

## **Employment Effects of Trade and Technical Change: Evidence from Norway**

**K Salvanes (Norwegian School of Business Administration, Bergen)**

**S E Førre (Statistics Norway)**

Exploiting matched worker/plant level data for Norway, we examine in this paper trade and technology explanations for the change in plant level skill composition using direct evidence on job creation and destruction for workers with high, medium and low education levels. Our data allows us to focus on two hypotheses new to the empirical trade/technology literature.

First we analyse whether the change in skill composition is taking place for all plants in each sector or whether reallocation of jobs and workers are across establishments leading to greater dispersion of skills across establishments. Whether an increased segregation of skills across establishments is then related to plant specific measure of technical change - the vintage of machine capital - and trade exposure. Secondly, the linked employer-employee data set enables us to test whether it is along the gross creation or the gross destruction margins the impact from trade and technology are taking place for different education categories of workers. The analysis shows that the changes are taking place by a reallocation of labour resources from some plants to other plants within sectors. The econometric analysis specifying plant level dynamic demand functions for job and worker flows, support skill-biased technical change via a positive gross job creation effect especially for plants with new vintages of capital from plants with old vintages of capital. As opposed to most studies in this literature we also find a strong impact from trade in that low and medium educated workers are being displaced from sectors hit by increased competition from abroad, while highly educated workers are basically insulated from negative trade effects.

**Keywords:** Job creation, education, technology, trade.

**JEL Classification:** J63, O33, F14.

## *Firm demographics I*

### **The Determinants of Plant Survival in Finnish Manufacturing**

**S Nurmi (Helsinki School of Economics)**

This paper studies the factors determining the survival of Finnish manufacturing plants over the period 1981-93. The life table analysis reveals that 35% of the plants do not survive for 4 years, and after eight years only 45% still exist. The effects of an exceptionally deep recession can be seen in the relatively high hazard rates at the beginning of the 1990.s. The employment growth of surviving new plants has been fast in all cohorts. Cox proportional hazards model is employed to study the role of various time-varying covariates in explaining the risk of failure. It is found that current size is a better predictor of survival than initial size. Higher productivity, profitability and wages decrease the risk of failure when industry heterogeneity is controlled for. Plants that belong to firms with more than one plant are more likely to exit than independent plants. Furthermore, changes in ownership status have an effect on the hazard rate. It is easier to survive in fast growing industries with a high level of MES, whereas higher industry job turnover rates increase the hazard faced by new firms. In addition, exposure to foreign trade turns out to be an important determinant of survival.

**Keywords:** survival, duration analysis, manufacturing

**JEL Classification:** C41, L11, L60

## **Statistics on New Enterprises, the Entrepreneurs and the Survival of the Start-ups**

**P B Nielsen (Statistics Denmark)**

The paper describes the methodology elaborated and used by Statistics Denmark in producing statistics on new enterprises. Statistics Denmark has developed this statistical monitoring of new enterprises solely on the use of administrative registers. The paper also lists the indicators developed for measuring the new enterprises and the persons behind these enterprises, the new entrepreneurs, and their qualifications. The ultimate goal of a policy concerning creation of new enterprises is not the mere creation but the survival of the new enterprises in order to create new job possibilities and new products and services in the ever changing economy. In order to enable the policy makers to evaluate the programmes for new enterprises, Statistics Denmark has as the last tool developed a longitudinal database including all new enterprises and identified by modelling a set of indicators of significance for the survival of the new enterprises.

## **Dynamics in the U.S. Retail Sector, 1976-1997**

**R Jarmin (CES)**

**S Klimek (CES)**

**J Miranda (American Univ.)**

This paper examines a number of dynamic processes in the U.S. Retail Sector from 1976 to 1997. Underlying the analysis is the newly constructed Longitudinal Business Database (LBD) at the U.S. Census Bureau. This dataset is constructed by matching twenty-five years of the U.S. Census Bureau's Business Register at the establishment level. The result is a dataset on the universe of establishments in the U.S. on an annual basis with detailed geographic and firm ownership information.

We use the information in the LBD to characterize the number of establishments, entry, and exit in SIC 53, General Merchandise Stores. We find some initial evidence that large establishments owned by multi-units drive most of the industry growth, in terms of both numbers of establishments and employment.

## ***Firm demographics II***

## **The longitudinal business database**

**R Jarmin (CES)**

**J B Jensen (CES)**

J Miranda (American Univ.)

## **Establishment Closure in Periods of Expansion and Contraction**

**A Nucci (CES)**

This paper reports on establishment closing during the expansionary periods of 1987 and 1997 and the contraction of 1992. Earlier work shows that establishments were more likely to close during the late 1980's expansionary period than during the early 1990's contractionary one. Nevertheless, the probability of establishment dissolution declines with age in the three years and the shape of the failure distributions are broadly the same for broad industry sectors, regions, and most employment size classes. The findings for the expansionary period 1997 answer the question whether the previous findings are anomalous by showing that establishment closure is once again elevated over that of the 1992 period. However, the 1997 findings are not as clear-cut as those of the earlier expansion and the probability of dissolution in the first years after formation differs for establishment subpopulations defined by characteristics industry, region, affiliation status, and employment size class. The latter findings reflect changes in the industrial and ownership population across these three periods. The establishment data used are drawn from the 1987, 1992 and 1997 economic census universe s of the US Bureau of the Census.

## **Use of plant level micro-data for SME innovation policy evaluation in Japan**

**K. Motohashi (METI and RIETI)**

Japan's SME policy has reached a major turning point. That is, traditional 'lifting up SMEs as a whole' type policy has been revised toward pro-competition policy to induce entrepreneurship and innovation in SMEs. In this paper, this policy direction and new innovation promotion schemes initiated by METI are evaluated by using plant-level micro data. Census of Manufacturing base longitudinal micro-data are linked with the list of firms participating in SME innovation policy scheme under the Law on Creative Activities in SMEs and the Law on Supporting Business Innovation in SMEs. Plant level pattern on industrial dynamics suggests both policies for new business start-up and innovation creation in existing firm are important. In addition, positive effects on sale growth by participating in a program of the Creative Activity Laws are observed.

**Keywords:** firm's growth, SME innovation policy, program evaluation, sample selection model

**JEL Classification:** C35, L10, L50

## **Dynamics of enterprise populations**

**J Alho (Univ. of Joensuu)**

**S Laaksonen (Statistics Finland)**

## ***Wage dynamics and mobility***

## **Trends in the Italian Earnings Distribution, 1985-1996**

**A Borgarello (LABORatio R Revelli)**

**F Devicienti (LABORatorio R Revelli)**

Using a panel of administrative Italian data (source: INPS), this paper provides new empirical evidence on the changes in the earnings distribution that occurred in Italy over a relatively long time period (1985-1996). Various statistical indicators have been used to document a slight, but not negligible, increase in earnings inequality. Decompositions by population subgroups have shed light on the underlying causes of the observed distributional changes.

## **Firm level worker turnover and wage dynamics in the low skilled labour market**

**J Miranda (American Univ.)**

## **Wage Mobility in Sweden**

**K Ierulli (Univ. of Illinois)**

**E Lazear (Stanford Univ.)**

**E Meyersson-Milgrom (MIT)**

In this paper we examine three main questions: 1. Are there demotion and promotion in Swedish firms between 1970 – 1990. 2. Are hires and fires substitutes or complements to reorganizing work within firms in order to create wage mobility. 3. What institutional factors may have contributed to changes in mobility and the factors determining mobility over the examined period ? We have access to extensive longitudinal data from Sweden collected and compiled by the Central Confederation of Employers SAF from their database on wage statistics assembled from establishment level personnel record. They contain information for white-collar workers in every industry in the private sector within the SAF domain. Member firms have been providing information to the database since 1970 – 1990.

Using movement in within-firm wage quartiles as the measure of wage mobility, we find that new hires increase upward mobility and exits increase downward mobility. This implies workers benefit from growth in firm size, as upward wage mobility is associated with substantial real increases in wages and downward mobility with real decreases in wages. Growing firms make workers better off both relatively and absolutely, due to increases in both within-firm upward mobility and real wages hence we find that the two types of devices influencing mobility are both at work and complements each other. Older workforces, on average, have less upward wage mobility, and workforces with a greater fraction of female employment have less overall wage mobility.

## ***Productivity I***

### **The Link Between Aggregate and Micro Productivity Growth: Evidence from Retail Trade**

**L Foster (Bureau of Census)**

**J Haltiwanger (Univ. of Maryland)**

**C J Krizan (Bureau of Census)**

Economists have been interested for a while in understanding the connection between microeconomic and aggregate productivity dynamics, but, for the most part, have had to rely on evidence from one sector of the economy to illuminate this connection. The

existing work on productivity growth in *manufacturing* has found that a substantial fraction of aggregate growth is due to the reallocation of outputs and inputs from less productive to more productive individual microeconomic units. Moreover, entry and exit of establishments play an important role in this reallocation: roughly thirty percent of productivity growth (measured as either multifactor or labor productivity) over a ten-year horizon is accounted for by more productive entering plants displacing less productive exiting plants. One of the few studies to include empirical results from outside the manufacturing sector, Foster, Haltiwanger, Krizan (2001), examines one three-digit industry in the service sector (automobile repair shops). The reallocation effects via net entry account for virtually all of the (labor) productivity gains in this industry. This striking finding raises questions about the nature of the reallocation dynamics and their connection to productivity for sectors outside of manufacturing. In this paper we seek to expand our knowledge of the connection between microeconomic and aggregate productivity dynamics by examining this connection within the retail trade sector.

## **Technology and human capital effects on wage and productivity dispersion**

**M Maliranta (ETLA, Helsinki)**

**J Vainiomäki (Univ. of Tampere)**

In this paper we examine technology and worker characteristics as sources of wage and productivity dispersion and the interrelationship of these dispersions using linked employer-employee data for Finnish plants. In explaining the increased wage dispersion across workers Davis and Haltiwanger (1991) and Dunne et al. (2000) have shown that in US manufacturing the *between plant* component of total wage dispersion is more important than the *within plant* component and that the increase in between plant dispersion explains a large part of the increase in total wage dispersion across individuals. Furthermore, Dunne et al. (2000) record an increasing trend in the between plant *productivity* dispersion, and show that increases in productivity and wage dispersions are *correlated* and both are related to computer investments and capital intensity of the plants consistent with skill-biased technology effects from theoretical models by Caselli (1999) and Kremer and Maskin (1996). In this paper we examine these questions for an other country and thereby attempt to cast some light on the possible effect of institutions on wage dispersion in general as well as on the dimensions and sources of wage dispersion in Finnish manufacturing in particular. First of all we decompose total wage dispersion into within and between plants components using linked worker-plant data for 1988-98, which allows us to estimate all dispersion components from the same data source. We also use Manufacturing Census data to examine between plant dispersion for a longer period of 1974-98. Second, we apply the Juhn, Murphy and Pierce (1993) full distribution accounting method to decompose the changes in between plants distribution of wages and productivity into components due to changes in observable plant and worker characteristics, changes in observable prices for these characteristics, and changes in unobservable factors (residual distribution). These decompositions are based on regressions of plant wages and productivity on plant characteristics like technology (R&D) and capital intensity. The linked data allows us to use also education, experience



and other (human capital) characteristics of plant's workers to control for worker quality, in addition to the plant characteristics available from Manufacturing Census.

## **The effects of labor and technology characteristics on productivity and wage in manufacturing and services**

**P Ilmakunnas (Helsinki School of Economics)**

**M Maliranta (ETLA, Helsinki)**

**J Vainiomäki (Univ. of Tampere)**

We use plant-level data to estimate production functions where, besides hours and capital, also employee characteristics (age, education, sex composition) are included. We also estimate similar models for wages to examine whether wages are based on productivity. Our aim is to explain productivity besides manufacturing, also in services. For the service sector plants, no data on capital input or value added is available. We use a stepwise procedure to examine whether the results for manufacturing are affected, if the capital input is omitted and technological differences are controlled by detailed industry-specific coefficients for a scale term and year dummies. Next we examine whether the output measure, value added, can be replaced by sales. Since the results do not change much, we proceed to estimate the final model for manufacturing and services combined. The effect of age on productivity is small, but wages show strong age effects. Higher educational level leads to higher productivity, but the effect on wage is even stronger. The share of female workers is negatively related to productivity, but this is not fully reflected in the wage level.

## ***Adjustment costs***

## **Employment Changes, the Structure of Adjustment Costs, and Firms' Size**

**Ø Nilsen (Univ. of Bergen)**

**K Salvanes (Norwegian School of Economics, Bergen)**

**F Schiantarelli (Boston College)**

In this paper we analyze the pattern of employment adjustment at the plant level using a rich data set for Norway. We first document the stylized facts about employment changes in small and large plants. The data reveals important differences across size classes. In particular, episodes of zero net employment changes are more frequent for smaller plants. A simple "q" model of labor demand is then developed, allowing for the presence of

fixed, linear and convex components in adjustment costs. Econometric estimation supports the importance of departing from traditional models of labor demand based solely on symmetric convex adjustment costs. Fixed (or linear) components of adjustment costs are important. There is, moreover, evidence that fixed costs contain a component that are unrelated to size, in addition to a components proportional to size. As a result, the range of inaction is wider for smaller plants. Finally, the quadratic components of costs are asymmetric and they indicate that it is more costly at the margin to contract employment than to expand it.

**Keywords:** Adjustment costs, employment demand, size.

**JEL Classification:** D21, C24, E24

## **On the Identification of Non Linearity in Equipment Investment Expenditures**

**W Letterie (Univ. of Maastricht)**

**G Pfann (Univ. of Maastricht)**

We investigate the existence and possible differences between low and high regimes of investment expenditures in equipment at the firm level. The existence of such differences is predicted by recent theoretical studies of investment behavior stressing the role of asymmetries and non-convexities in the adjustment cost technology. In the low regime, investment data are generated from a smooth linear-quadratic optimization process. In the high regime, peak investment data are generated from a non-convex, lumpy process. The switching regime model is estimated for a balanced panel of Dutch firms operating in 13 different industrial sectors. Our results indicate a significant difference between high and low regimes. The low investment regime accounts for 80 percent of all observations, the remaining 20 percent are in the high regime.

**JEL Classification:** E22

## **The Structure of Adjustment Costs and the Properties of Job and Worker Flows**

**J Varejão (Univ. of Porto)**

**P Portugal (Bank of Portugal)**

In this paper, analytical tools developed by the literature on job and worker flows are used to characterize the establishment-level pattern of employment adjustment. This permits to uncover some results that add significantly to our knowledge of the effects of

adjustment costs on the functioning of labor markets. A previously unsuspected degree of lumpiness in employment adjustment is documented and statistical analysis of duration data unequivocally links it to the structure of adjustment costs. The competing explanation – the pattern of shocks – is successfully ruled out.

### ***The OECD firm-level project***

#### **Comparative Analysis of Firm-level Data: a low marginal cost approach**

**E Bartelsman (Free univ. Amsterdam)**

This paper provides a description of the work undertaken for the OECD Economics Department growth project and draws lessons for improvement of the cross-country analysis that may be done through such projects. The paper makes suggestions to improve the organization of the data and meta-data available at national statistical offices in order to reduce delivery-time and costs of undertaking such projects. The paper concludes with a recapitulation of the results of the firm-level study, and provides a quick-scan of further questions that can be explored using firm-level sources.

#### **The Sources of Productivity Growth: Micro-level Evidence for the OECD**

**J Haskel (Univ. of London)**

**M Barnes (Univ. of London)**

**M Maliranta (ETLA)**

We document the decomposition of productivity growth in OECD member states using the data resulting from the OECD Firm Level Study. Our results suggest a substantial role for within effects in most countries. The entry and exit effects seem to vary with institutions. Considering employment protection, relative to the US, other countries typically have exitors who are more productive than average, lowering the exit contribution to productivity growth. But entrants are also more productive than average, raising the entry contribution to productivity growth.

# **COMPARATIVE ANALYSIS OF FIRM DEMOGRAPHICS AND SURVIVAL: MICRO-LEVEL EVIDENCE FOR THE OECD COUNTRIES**

**S Scarpetta (OECD)**

**E Bartelsman (Free univ. Amsterdam)**

**F Schivardi (Bank of Italy)**

This paper presents evidence on firm demographics and firm survival for a group of ten OECD countries. For each country a dataset of sectoral indicators of firm dynamics has been created using information from business registers. The patterns of firm entry, exit, survival and employment growth are described and analysed across countries, sectors, and over time.

Further, the paper provides a discussion of how these data may be used to gain a better understanding of the process through which economic policy and institutions may affect aggregate patterns of employment, output, and productivity growth.

**Keywords:** entry, exit, survival, firm size, micro data

**JEL Classification:** L11, G33, M13

## ***Innovation***

### **Innovation and productivity in services**

**H van der Wiel (Statistics Netherlands)**

Slow labour productivity growth has been a salient feature of the Dutch economy for a while, especially in (business) services. Using firm-level data from the Dutch business services sector, the article aims to explain this feature by analyzing whether the slow growth is due to a lack of innovation. Innovation expenditures in the period 1994-1996 were, in fact, rather low from an international perspective. The article shows that innovating firms in Dutch business services realized higher productivity growth rates than non-innovating firms. Remarkably, innovation did not go along with superior growth rates in turnover, but was instead accompanied by lower growth rates of employment.

## **Linking innovation to productivity growth using two waves of CIS**

**G van Leeuwen (Statistics Netherlands)**

Using two waves of the Community Innovation Survey for the Netherlands we integrate recent lines of research to estimate the contribution of innovation to manufacturing multi-factor productivity (MFP) growth. The model uses CIS data to control for the complementarity between internal and external knowledge bases and also investigates the importance of within-firm time interdependencies for inputs into innovation and innovation output. Our results show the benefits of including more information on the technological environment of firms. Furthermore, our model shows that we have a lower persistence of innovativeness measured from the output side than for R&D if we track the innovation performance of the same firms through time. It is also found that the contribution of innovation to MFP increases if we use all available data. The latter result reflects the difficulty of accounting properly for the non-rivalry of innovation and the associated inter-firm ‘spillovers’ of knowledge creation when using firm-level panel data only.

**Keywords:** Innovation, Research, Technological opportunities, Simultaneous-equations models, productivity.

**JEL Classification:** C24, C31, C34, L60, O31, O32

## **ICT competencies in the Norwegian economy**

**T E Braadland (STEP, Oslo)**

**A Ekeland (STEP, Oslo)**

Although much ICT-related activities take place in non-ICT industries, it has hitherto been difficult to measure the extent of such activities in a quantitative and comparative way. Most ICT overviews have used traditional *producer*-focused classifications (like employment or turnover in manufacturing of office machinery) and thereby ignoring the large and widespread activities in ICT *user* industries. This paper uses a new empirical approach to determine the extent of ICT in the whole economy. The method used is identifying and quantifying employees with formal ICT competencies with respect to company sizes, regions and industries. This method, based on register data, provides us with a completely new approach to understanding the use and extent of ICT in ICT *user* industries and not least in public sector, of course in addition to providing a more realistic picture of ICT activities in regular ICT industries as well.

The main results from this report are:

- It is commonplace to look at ICT producer industries when accounting for national or regional ICT performance. Our study demonstrates empirically how ICT knowledge is found in many industries. About 60 percent of Norwegian ICT competencies are found in what we term ‘user industries’.

- Dominant industries, measured in ICT skill density, are Power and water supply, Oil extraction and Machinery and equipment. The single largest ICT ‘industry’ is still Business services and computing, with about 6.000 employees with formal skills in ICT. The most ICT-intensive industries are still producer industries like Electronic and optical industries and Business services and computing. Lack of international studies with the same approach makes it, however, impossible to judge how these industries perform in an international comparison.
- Industries experiencing the fastest increase in ICT intensity, measured as higher-than-average ICT growth and lower-than-average overall employment growth, are Printing and publishing, Chemicals, Transport equipment, Machinery and equipment and Non-metal goods. Education is an industry that comes out least well in such an overview. This activity shows both decreased number of ICT skilled and increased number of ‘regular’ employees, resulting in a profound decrease in ICT density.

### *Unions, changing work organizations*

## **Flexible Work Systems and the Structure of Wages: Evidence from Matched Employer-Employee Data**

**T Bauer (IZA, Bonn)**

**S Bender (IAB, Nürnberg)**

A growing theoretical and empirical literature is concerned with the effects of flexible workplace systems or High Performance Work Organizations (HPWOs) on wages. Existing theoretical literature suggests that these forms of organization should lead to higher inequality across firms, increased segregation of labor markets and decreased within-firm inequality. This paper makes use of a new employer-employee-linked data set for Germany to examine the labor market effects of flexible workplace systems. Our results suggest that HPWOs increase both across and within firm inequality. We do not find evidence, however, that HPWOs affect their employment structure.

**Keywords:** Organizational change, wages, employment, linked-employer-employee data set, inequality

**JEL Classification:** J51, J65

## **Changing organization and industrial relations at workplace level**

**P Nielsen (Aalborg Univ.)**

## **Unions and Employment Growth in British Workplaces During the 1990s: A Panel Analysis**

**A Bryson (Policy Studies Institute, London)**

This paper uses the 1990-1998 Workplace Industrial Relations Survey (WIRS) Panel to analyse the impact of unions on employment growth among private sector workplaces in Britain. The growth rate among unionised workplaces was 3-4 per cent per annum lower than among non-unionised workplaces, *ceteris paribus*. The effect is not accounted for by the age of unionised workplaces, their concentration in declining industries, or organisational or technical change at workplace level. The effect remains once we account for the impact of unions on workplace survival. Non-union worker voice had no significant effect, suggesting that the union effect arose through wage bargaining. In private manufacturing, employment grew by 3 per cent per annum less where unions were present, *ceteris paribus*. The effect was only apparent where at least 80 per cent of workers had their pay set through collective bargaining. This suggests unions required a certain degree of bargaining strength to affect employment growth in manufacturing. In private services, the annual growth rate of unionised workplaces was 4-5 per cent less than comparable non-union workplaces. Union effects were confined to unions negotiating over wages but not employment, suggesting unions modified their wage claims where management involved them in decisions over employment.

**Keywords:** employment growth; trade unions

**JEL Classification:** J23, J51

## ***Labour supply issues***

## **When and how do young Italian workers enter the labour market? An analysis on Public Labour Exchange micro-data**

**F Bassi (Univ of Padua)**

Youths' unemployment is a major concern in the Italian debate on the functioning of the labour market. Even in those areas of the country where the unemployment rate is low, young people find it difficult to enter the labour market, regardless their educational and professional background. On the one hand, in some areas the unemployment rate among

young people is much higher than average. On the other hand, in areas featuring comparatively lower unemployment rates matching problems occur: young workers do not find jobs adequate to their level of education while enterprises find it difficult to recruit workers meeting their needs. Moreover, the recent evolution of the Italian labour market seems to increasingly offer short-term employment opportunities with a reduced level of social securities. To a large extent, these opportunities are intended for young people. The aim of this paper is to document the timing of youths' first entrance into the labour market and to characterise the broad features of their early work history. Specifically, we provide some answers to the following questions: at which age do young people start looking for their first job? Which kind of link do they establish to the recruiting firms? How do Italian firms use the opportunities made available by the Italian labour regulations to ease the recruitment of youths?

The analyses we carried out exploit administrative data collected at the Italian Public Labour Exchange (PLEs). In Italy, each person searching for a job in the private sector needs to join a list at his/her reference PLE. Registration in the lists gives rise to a collection of information on the worker (demographic characteristics, educational background, professional experience). Workers' labour history is then followed over time. Private enterprises have to communicate to their reference PLE newly established labour contracts and any modification of existing employer-employee links, together with information on their demographic characteristics, economic activity, type of contracts in use. Each worker and each enterprise are uniquely identified by a code. This builds up an employer-employee linked database containing continuously updated detailed information.

Working histories over a four-year period (from 1995 to 1998) of a sample of young workers living in a region of North-East Italy have been analysed.

## **Overtime in Finland**

**P Böckerman (LIER, Helsinki)**

This study is about the incidence of overtime hours in Finland. The investigation uses unique individual-level data from the manufacturing industries from 1989 to 1995. The results reveal that the hours of overtime divided by the number of total hours decline as an employee ages. The overtime hours also decline in wage per straight-time hours and in straight-time hours. Males and newcomers tend to work more overtime, but leavers work less overtime. In addition, the overtime hours are more frequent in the population of small establishments in the Finnish manufacturing industries. There are also strong industry effects.

**JEL Classification:** J21



## **The elasticity of labour supply facing each establishment**

**E Barth (Institute for Social Research, Oslo)**

**H Dale-Olsen (Institute for Social Research, Oslo)**

This paper studies the elasticity of labour supply facing each establishment. The analysis builds on theoretical models of labour supply acknowledging frictions in the labour market. It uses a Norwegian linked employer-employee panel of workers with specific educational background (unskilled workers, technical engineering, economic / administrative) over a 9 year period to estimate the elasticity of labour supply to each establishment. The panel is used also to derive an empirical wage distribution across establishments, which properties are studied in detail. The paper presents some evidence on unobserved individual productivity characteristics as well.

**JEL Classification:** J21, J31, J42, J63

## ***Productivity II***

## **THE EFFECTS OF FEDERALISM AND PRIVATIZATION ON PRODUCTIVITY IN CHINESE FIRMS**

**S Dougherty (Conference Board)**

**R McGuckin (Conference Board)**

This study offers empirical evidence about how the structure of government and private ownership affects productivity in Chinese firms. It uses the microdata of China's most recent decennial industrial census, covering all of the 23,000 large and medium industrial firms operating in China during 1995. The results show that government decentralization – “federalism” – plays an important role in improving the performance of not just collective firms, but also stateowned and mixed public/private ownership firms. This result is strongly confirmatory of much of the recent theoretical work on transition economies that posits a key role for government in the efficient operation of markets. Privatization makes a big difference in performance for firms administered at the federal level, especially state-owned enterprises. Private ownership also makes a large difference for wholly foreign-owned firms, nearly all located in special districts. In local jurisdictions, however, there is little difference in productivity across the various nonstate ownership types, supporting the argument that the regulatory environment played a critical role in successful business performance.

**JEL Classification:** D23, H73, K23, O14, P31

## **Assessing the impact on productivity: plant-level evidence from Sweden**

**T Lindström (Central Bank of Sweden),**

**C J Morrison Paul (Univ. of California, Davis)**

**D Siegel (Univ. of Nottingham)**

## **Productivity growth and micro-level restructuring; Finnish experiences during the turbulent decades**

**M Maliranta (ETLA, Helsinki)**

The appearance of productivity-enhancing restructuring at the plant level (the so-called between and net entry effects) has contributed substantially to the acceleration of labour and total factor productivity growth in Finnish manufacturing in the period from the latter part of the 1980s up to the mid-1990s. The recent years have witnessed chilling in these components of aggregate productivity growth. We find evidence that increased export-orientation towards the Western markets and increased R&D intensity have contributed to aggregate total factor productivity through plant-level re-structuring with a lag of some 3 to 5 years. The chilling in the between-plant component in recent years can be explained by the fact that while the gap to the international technology frontier has been narrowing there are less and less needs and opportunities for extra productivity growth through micro-structural adjustment. We have found that micro-structural factors of aggregate productivity growth have an important role to play in diminishing productivity and wage dispersion between plants. In the recession years external adjustment through entry and exit and, to a lesser extent, through restructuring among incumbents has improved aggregate productivity performance in some service industries as well. But the recovery period has entailed chill also in many non-manufacturing industries.

## **Within and Between Firm Changes in Human Capital, Technology, and Productivity**

**John Abowd (Cornell Univ.)**

**J Haltiwanger (Univ. of Maryland)**

**J Lane (American Univ.)**

**L Sandusky (Bureau of Census)**

Understanding how the introduction of new technology impacts firms and in turn impacts workers has increasingly become important in the past two decades – particularly understanding the dynamic consequences of firms' decision to invest in advanced technology such as computers. Yet little is known about this interaction - measures of human capital at the firm level have been very limited, detailed firm-level measures of technology are difficult to obtain in general and especially for service sector businesses, and longitudinal data on firms are not widely available. This paper uses new data which remedies many of these deficiencies to provide a detailed examination of these issues for all sectors of the economy: first by documenting how the demand for human capital has changed within and between businesses and then by using firm level data to examine the link between changes in technology and the demand for human capital. We take a broad view of changes in technology in this context – we are interested in observable changes in physical capital with an emphasis on the role of advanced technology such as computers and changes in intangible capital such as organizational and business practices.

### ***Industrial economics***

#### **Efficiency in Danish publishing & printing industries**

**M Dilling-Hansen (Aarhus Univ.)**

**E S Madsen (Aarhus School of Business)**

**V Smith (Aarhus School of Business)**

#### **Green Subsidies and Learning-by-doing in the Windmill Industry**

**J D Hansen (Univ. of Odense)**

**C Jensen (Copenhagen Bus. School)**

**E S Madsen (Aarhus School of Business)**

This paper examines the remarkable learning-by-doing in the windmill industry since it emerged in the beginning of the 1980's. Green subsidies for producing electricity by wind power has been a precondition for the rapid growth in the production of windmills. Based on time series of prices of windmills a dynamic cost function for producing windmills is tested. The cost disadvantage of producing electricity by windmills relative to traditional power stations has narrowed considerably because of a strong learning-by-doing effect. The deliberate policy to subsidize production of electricity by windpower has placed

Denmark in a first-mover position in this market and the future has to show whether this is a successful story of an infant industrial policy.

**Keywords:** Learning-by-doing, infant industry, green subsidies

**JEL Classification:** D2, L5, L6

## **The Business Cycle, Macroeconomic Shocks and the Cross Section: The growth of UK Quoted Companies**

**C Higson**

**S Holly**

**P Kattuman (Univ. of Cambridge)**

**S Platis**

In this paper we bring to light a significant aspect of firm level heterogeneity over the business cycle. We analyse the responsiveness of firm growth (quoted UK companies, over the thirty year period to 1997) to aggregate shocks, conditioning on firm size, age and industry. We find that the effects of aggregate shocks, positive and negative, are more pronounced for firms in the middle range of growth. We show that, the higher moments of the distribution of firm growth rates are significantly counter cyclical, and that this follows from the fact that rapidly growing and rapidly declining firms are less sensitive to aggregate shocks than firms in the interior of the growth range. These findings are of importance in understanding firm level as well as business cycle dynamics.

**Keywords:** Business cycles, cross sectional moments, firm growth

**JEL Classification:** E32, D21, D92

## **Assessing the impact of management buyouts on economic efficiency: plant-level evidence from the United Kingdom**

**R Harris (Univ. of Durham)**

**D Siegel (Univ. of Nottingham)**

**M Wright (Univ. of Nottingham)**

## ***Job and labour mobility***

### **Immigrants' and Natives' Unemployment-risk: Productivity Differentials or Discrimination?**

**M Arai (Univ of Stockholm)**

**R Vilhelmsson (Univ of Stockholm)**

Studying the unemployment risk during 1992 to 1995 for a sample of employees in 1991, we find that immigrants from the non-European countries run a risk of unemployment that is twice the corresponding risk for the native workers. There exist substantial unemployment-risk differentials taking into account employees' demographic and human capital characteristics, the wage-rate in 1991 and systematic sorting of workers across establishments associated with varying unemployment risks. Exaggerating beyond all reasonable limits, the ability differentials (measured in school grades and IQ-tests) between immigrants and natives fails to explain the differences between immigrants and natives in unemployment risks. Our simulations indicate that the observed unemployment-risk differentials between native and non-European workers correspond to ability differentials that are at least as large as the whole range of IQ-scores. Our conclusion is that discriminatory behavior and stereotype beliefs must be involved. Furthermore, we report results indicating that the existing income-gap between immigrants and natives in Sweden is almost entirely due to unequal employment opportunities.

**Keywords:** Immigration; Unemployment; Discrimination

**JEL Classification:** J71; J15; J61; J64

### **Incentives in Economics Departments I: Dynamic Incentives**

**T Coupé (ULB, Brussels)**

**V Smeets (ULB, Brussels)**

**F Warzynski (Univ. of Leuven)**

In this paper we study the labour market of economist; more specifically we analyse dynamic incentives in economic departments. We look at the mobility and promotion

patterns of a sample of 1000 top economist over thirty years and link it to their productivity and other personal characteristics. We can find that:

1. The probability of promotion and of upward mobility is positively related to past production
2. The sensitivity of promotion and mobility to production diminishes with experience, indicating the presence of a learning process
3. Publications are a more important determinant of the probability of promotion in the US than in Europe
4. The sensitivity of the promotion decision to production declines less with experience in Europe than in the US, indicating a difference in the learning process
5. Economists respond to incentives: they tend to exert more effort at the beginning of their career when dynamic incentives are important
6. We detect evidence of a sorting process, the more productive individuals being allocated to the best and universities.

## **Job mobility and job tenure in Denmark**

**D Koch, P Stender**

**S Leth-Sørensen (Statistics Denmark)**

### **Where did they go?**

**N Westergård-Nielsen (Aarhus School of Business)**

**A Frederiksen (Aarhus School of Business)**

We study individual job-separations and their associated destination states for all individuals in the private sector in Denmark for the period 1980 to 1995 and account for the cyclical flows. We find that individual and workplace characteristics as well as business cycle effects are important in explaining the individual behaviour. In policy simulations we look at the impact on individual transitions. We find that structural and growth policies have different implications for the economy. Policy interventions with the purpose of preventing firm closures are argued to be inefficient.

**Keywords:** Business cycles; Job separations; Transition probabilities

**JEL Classification:** J63; J65; E24

## ***Compensation***

## **THE STRUCTURE OF INCENTIVE CONTRACTS: EVIDENCE FROM AUTO DEALERSHIPS**

**M Gibbs (Univ. of Chicago)**

We analyze a dataset on incentive contracts, performance, organizational policies, and behavioral indicators from auto dealerships. A description of the form of actual incentive contracts is provided first. Specific bonus formulas tend to be very simple. However, overall incentive contracts are more complex, with managers often earning more than one bonus on different accounting measures, and discretionary bonuses based on subjective evaluations. We then analyze determinants of formula and discretionary bonuses. Statistical properties of performance measures, multitask incentives, and decentralization all appear important to incentive contract design. Satisfaction with the incentive plan, especially with how performance is evaluated, is important in explaining the weight put on various factors in subjective evaluations.

## **Firm Performance Pay and Job Characteristics**

**W Schnedler (IZA, Bonn)**

Contract theory predicts that workers are remunerated based on unbiased individual performance measures. In the real world, such performance measures are often not available, instead the employer has to rely on effort signals which usually do not reflect all dimensions of effort. Moreover, the principal might not know the optimal allocation of effort at a job or between jobs. On the other hand, the principal can perhaps link payments to non-individual measures. Payments based on such aggregated measures should be decreasing in the knowledge of the principal. This hypothesis is tested using a French cross-sectional micro-data set.

**Keywords:** incentive schemes, firm bonus pay, random censoring

**JEL Classification:** J33

## **Gender Differences in Managerial Compensation - Evidences from Danish Data**

**M Lausten (Institute for Social Research, Copenhagen)**

This paper examines the gender earnings gap at the executive level on a unique data set of Danish executives in the period 1992-1995. Ordinary wage equations show that the

wage gap disappears when controlling for “Who you are”, “Where you work” and “What you do”. Additionally, decomposition into inter- and intra-occupational differences shows that two thirds of the wage gap are due to differences between occupations. Individual-specific characteristics contribute negatively to the wage gap, i.e. in favour of women. Decomposing by real authority level shows a larger unexplained part of the wage gap. Real authority is more discriminating than formal authority.

**Keywords:** Managerial compensation, gender wage gap, corporate governance

**JEL Classification:** J31, L2, J44, G3

## **Paying More to Pay Less? – The Costs of Worker Turnover**

**H Dale-Olsen (Institute for Social Research, Oslo)**

This paper presents an empirical analysis based on a model acknowledging technology and wage dispersion, search frictions and costly worker turnover. Utilising a matched employer-employee data set covering 3883 Norwegian establishments and nearly 2000000 observations of jobs during the period 1989-96, we show that high capital intensive establishments, pay more, and experience less worker turnover. Worker turnover is costly for the establishments, and strictly convex turnover costs are identified. Simulation of the wage policy, show that on average, by offering the workers’ expected alternative wage only, an establishment reduces its operating surplus to 37 per cent of the original surplus.

**JEL Classification:** D21, D23, J63

## ***Classification of firms***

## ***The “true” distribution of firm size in two Industrial Districts: A semi-parametric analysis***

**F Cipollini (Univ. of Florence)**

**P Ganugi (Univ. of Piacenza)**

In this paper we study firm size of two old and by now classical Industrial Districts of Italy. The interest for this kind of research sources by at least two reasons.

1. The first concerns the possibility of fitting data of firm size with a typical distribution. As it is in fact summarised by Schmalensee (1992) and more recently by Sutton (1997),



the literature on concentration has been characterised by a “growing pessimism about the “reasonableness” of postulating some “typical” form for the size distribution” (Sutton 1997, p. 52). Empirical work reviewed by Sutton is built in some cases on fix and in others on variable panels of firms. The same choice of panel implies to consider firms only in activity or, at the contrary, also those in entrance and exit. The pessimism of Schmalensee and Sutton about a typical firms size distribution sets against conclusions of the intensive work on concentration produced in the 60’s and 70’s by Ijiri and Simon (1977), Aitchison and Brown (1963), Steindl (1965). According to this literature, data on firm size are well fitted by known and typical distribution. For example, with fix panel data size distribution is lognormal and that of the largest firms is Pareto. Because, as it is known, Industrial Districts are (or at least they are considered) the engines of Italian economy, it is perhaps a relevant task to corroborate both the above position on two of the oldest Italian Industrial Districts.

2. The second reason concerns the “technology” of the research. Even if decisive, the intensive work produced in the 60’s and 70’s looks today characterised by a quite obsolete methodology. The approach of the above literature is in fact exclusively parametric and lacks completely of an extensive data analysis. The cause of this fact is simple: non parametric approach springs in the 80’s and becomes widespread in the 90’s. On the other side, non parametric approach used nowadays for modelling different data distributions is kernel. But as it is known, kernel is not little influenced by the choice of bandwidth and even if in a much less extent also by the fact it is fix or variable.

Aiming to fill this gap still remaining in the methodology of the research on firm size, in this paper we make use of an explorative and semiparametric approach based on quantiles. On this topic some authors (see, among others, Benedetti (1976), Hoaglin (1985a, 1985b), Badrinath and Chatterjee (1988), Badrinath and Chatterjee (1991), Mills (1995), Cipollini (2001)) have produced extensive research. Through quantiles analysis, skewness and elongation of our data is investigated. The same quantiles are used to calculate  $g$  and  $h$  parameters by whom semiparametric analysis is developed. Also we have supported the above work with parametric tests. The results of our analysis does not confirm the increasing skepticism about a typical size distribution. Working on fix panel of companies our analysis points out that lognormal fits well firm size of the two Italian districts. Because our research is worked out on a fix panel without any consideration of entries and exit, it has to be interpreted as a first step of a broader research to develop on size distribution of Industrial Districts including demography. On the other side, aiming to avoid a misleading reduction of the significance of our two panels we have to remember they include the universe of companies in activity for 4 years in the two districts, i.e the core of their industrial structure.

## **A first attempt at a systematic classification of firms based on the competence of their employees**

**A Ekeland (STEP, Oslo)**

## **Classification of the Retail Trade Sector by Enterprise or Product: Effects on the Evaluation of the Enterprises' Economic Performance**

**R Gismondi (ISTAT)**

**A R Giorgi (ISTAT)**

The Italian monthly retail trade survey, currently carried out by ISTAT, reveals that enterprises characterised by a given main activity may either sell a unique kind of product or various classes of products, different from the one corresponding to the main activity. Retail trade enterprises have been classified according to a criterion depending on the number of products sold. Consequences on average sales estimates and on a productivity indicator, given by the ratio between turnover and number of persons employed, have been analysed and commented.

**Keywords:** Classification, Main activity, Productivity, Retail trade, Turnover

### ***Internal labour markets***

## **On Heterogeneity among Displaced Workers**

**B Kriechel (Univ. of Maastricht)**

**G A Pfann (Univ. of Maastricht)**

In this paper we present results from a labor market survey conducted among 5644 workers three years after being displaced from a bankrupt firm in the Netherlands. The development of the survey instruments, the survey implementation, as well as the methodology to evaluate possible non-response bias is described. Evidence on the labor market status, search time and changes of earnings are presented. We combine the survey data with data from firm's personnel files to reveal sources of heterogeneity in search time and earnings gains and losses among workers subject to mass displacement. The hierarchical level and the specificity of the job prior to layoff are found to be important predictors of observed post-displacement differences among workers.

**Keywords:** Bankruptcy, idiosyncratic earnings losses, reservation wage dynamics

**JEL Classification:** J33, J63, C42

## **Internal Labor Markets: Evidence from Firm-Level Personnel Data**

**T Dohmen (Univ. of Maastricht)**

**B Kriechel (Univ. of Maastricht)**

We analyze ten years of personnel data from the Dutch aircraft manufacturer Fokker to shed light on the functioning of internal labor markets during periods of growth and decline. The hierarchical structure is little affected during corporate expansion, but the relative size of hierarchical levels changes during downsizing episodes. Entry is concentrated in the lower blue- and white-collar job levels, but there are no clear ports of entry. New entrants are usually younger and have higher schooling degrees than incumbent workers who are promoted to the same job level. Careers are important as wages are strongly related to job levels despite substantial variation in individual within-job-level wages. Promotion rates fall while demotion rates rise during early downsizing episodes. Horizontal job-mobility is also important as it affects promotion prospects and wages.

**Keywords:** Internal Labor Markets, Personnel Economics, Worker Mobility

**JEL Classification:** J31, J41, J63

## **Competitive Position and Promotion Rates: Commercial Television Station Top Management, 1953 – 1988**

**J Sørensen (MIT)**

While the scholarship on internal labor markets and promotion chances has contributed substantially to the sociology of organizations and labor markets, it has not developed a rich understanding of how career trajectories are influenced by the firm's competitive position in its product market. We argue that fruitful insights can be obtained by understanding how employee opportunity structures are influenced by an employer's competitive position. Our central claim is that a firm's implicit bargaining power over its employees depends on its position in its product market, and particularly the firm's sensitivity to environmental change. The greater the firm's bargaining power, the less the firm will be compelled to use promotions as a device to induce productivity. Firms occupying robust competitive positions in their product markets should have greater bargaining power in the labor market and be less likely to fill vacancies through internal promotions. Analyses of promotion rates among top managers in a longitudinal sample of television stations support our thesis.

## **Pay, Technology and the Cost of Worker Absence**

**M Coles (Univ of Essex)**

**J Lanfranchi (Univ. Paris II)**

**A Skalli (Univ. Paris II)**

**J Treble (Univ. of Wales)**

Conventional studies of absenteeism concentrate on labour supply aspects. In this paper we analyse records of worker behaviour which enable us to investigate whether or not demand side effects exist. Are there are differences in contract structure and behaviour across firms that can help explain the observed pattern of absence rates?

The theoretical background to the study is the models in Coles and Treble(1993,1996). Data are from the *Enquête sur la structure des salaires et de la rémunération, 1992*, and *Réponse*, two linked cross-section surveys of French establishments, in which managers are asked about their firms as well as a sample of workers in each firm.

We investigate the relationship between rates of pay and rates of absence, and how this relationship differs between firms with different technologies. It is to be expected that firms generally would pay no higher wages for a less reliable workforce than for a more reliable one, and we confirm this expectation. More subtle is the rate at which remuneration should fall with increased unreliability. We claim that just-in-time technology implies that absence will be more expensive for firms adopting it. The loss of productivity when absence occurs will be greater for such firms than for others, and the wage premium for reliability should thus be higher for such firms. This is what we find. For all workers in non-JIT establishments in our sample, the slope of the log wage absence rate relationship is about  $-0.15$ , in JIT establishments it is rather more than twice this. The between estimates give slopes that are higher than this. For blue-collar workers only, non-JIT establishments pay no premium for reliability, but for JIT establishments, the slope of the wage/absence locus is  $-0.15$ . As well as an intrinsic interest, our estimates provide a new means of assessing the costs of worker absence to an economy.

### ***Firm size***

#### **The Firm Size Effect: fact of artifact?**

**J Ekberg (Stockholm School of Economics)**

**M Salabassis**

The size-wage effect is well documented in the empirical literature, and typical attempts of explanation center on the supply side, using variations of the human capital approach, perhaps combined with institutional theories. With conclusive evidence of its source yet to emerge, an alternative approach with interesting prospects attempts to give the demand side a more active part to play. Interpreting jobs as tasks, potentially firm-specific and organized in hierarchies, the optimal position for an individual can be assumed to be a function of ability and human capital, while the wage for a specific task is primarily decided by its value for the firm. Then, the role played by human capital changes, its effect being only indirect on wages, and the issue of how the existence of task structures, or career ladder, affect wages becomes paramount. Using data with detailed information about job content and structure, evidence of a natural positive correlation between size and structure is found. Combined with the reasonable assumption of a positive correlation between the position of tasks in the hierarchy and the wage size effect may very well come out positive and significant if we fail to control for it making it an artifact of the data rather than an accurate description of the world

### **Stability and turbulence of the size distribution of firms: Evidence from Dutch manufacturing**

**O Marsili (Univ. of Eindhoven)**

This paper examines the Pareto law over time and across sectors in Dutch manufacturing firms. The analysis is based on longitudinal data from the census of enterprises in the Netherlands in 1978 – 92. The size distribution is highly skewed. It resembles closely the Pareto for the broad majority of firms in the aggregate manufacturing although the lower tail conforms better to the lognormal; a variety of patterns emerges across sectors. The shape of the distribution changes over time and displays a “seesaw effect” as it becomes steeper and then less steep in correspondence of an economic recession. Within the distribution, small and medium firms show a certain mobility in periods of relative stability of the overall distribution.

**Keywords:** Size distribution; Zip f plot; Gibrat’s law

**JEL Classification:** L11, L16

### **Firm-Size Premium and Human Capital**

**H Piekkola (ETLA, Helsinki)**

This paper uses linked employer-employee data from Finland over the period 1989-1996 to examine wages and worker mobility in firms of different sizes. A well-developed literature on training by firm-size shows that human capital accumulation is higher at

larger firms and employment relationships are longer. It is shown that in large firms employees with longer employment relationship enjoy seniority payments. It is also often found that workers with observed skills are concentrated in large firms. This is found to be the case in the largest firms with over 1,000 employees and in R&D intensive firms. Unobserved human capital is instead the only component rising monotonically in firm size. Compensations for unobserved human capital is referred to as high wages of the individual throughout his/her work career not explained by experience, sex, education and interactions to firm factors. Compensations for unobserved human capital leads to lower unwanted job seeking and also relates to option value of new workers for good performance. The option value of new workers requires that the firm has private information about a worker's output or that workers suffer from mobility costs when moving to another firm. It is shown that large firms have monopsony power in labour market and can screen the best workers. We show that the larger the firm the lower are the fixed costs per worker in recruitment. Unobserved human capital is also less transferable than compensations on education increasing job search costs for workers.

**Keywords:** wages, compensation policy, productivity, industry differentials

**JEL Classification:** J21, J31, J50, C22